

C L A I M S

1. A steel sheet for a tension mask excellent in  
the shielding properties from geomagnetism, said steel  
sheet consisting essentially of lower than 0.1% by  
5 weight of C, lower than 0.2% by weight of Si, 0.4 to 2%  
by weight of Mn, not higher than 0.1% by weight of P,  
not higher than 0.03% by weight of S, not higher than  
0.01% by weight of sol. Al, 0.003 to 0.02% by weight of  
N, and the balance of Fe, and having an anhysteretic  
10 magnetic permeability of 5,000 or higher.

2. The steel sheet for a tension mask according  
to claim 1, wherein said anhysteretic magnetic  
permeability is 5,200 or higher.

3. The steel sheet for a tension mask according  
15 to claim 1, wherein said anhysteretic magnetic  
permeability is 6,000 or higher.

4. A method of manufacturing a steel sheet for a  
tension mask excellent in the shielding properties from  
geomagnetism, comprising the steps of:

20 obtaining a steel piece consisting essentially of  
lower than 0.1% by weight of C, lower than 0.2% by  
weight of Si, 0.4 to 2% by weight of Mn, not higher  
than 0.1% by weight of P, not higher than 0.03% by  
weight of S, not higher than 0.01% by weight of sol. Al,  
25 0.003 to 0.02% by weight of N, and the balance of Fe;  
hot rolling said steel piece;  
cold rolling once or a plurality of times the hot-

rolled steel sheet with or without an intermediate annealing treatment interposed between the adjacent cold rolling processes so as to prepare a steel sheet having a predetermined thickness; and

5 annealing the resultant steel sheet under a temperature region not higher than the recrystallization temperature so as to increase the anhysteretic magnetic permeability.

5. The method of manufacturing a steel sheet for  
10 a tension mask according to claim 4, wherein said annealing step is carried out under a temperature range between the recrystallization temperature and 510°C.

6. The method of manufacturing a steel sheet for  
15 a tension mask according to claim 4, wherein said annealing step is carried out under a temperature range between the recrystallization temperature and 560°C.

7. A steel sheet for a tension mask excellent in both the shielding properties from geomagnetism and the creep resistance under high temperatures, said steel sheet consisting essentially of lower than 0.1% by weight of C, lower than 0.2% by weight of Si, higher than 0.6% and not higher than 2% by weight of Mn, not higher than 0.1% by weight of P, not higher than 0.03% by weight of S, not higher than 0.01% by weight of sol. 20 Al, not lower than 0.006% and lower than 0.01% by weight of N, and the balance of Fe, and having an anhysteretic magnetic permeability of 5,000 or higher.  
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8. The steel sheet for a tension mask according to claim 7, wherein said anhysteretic magnetic permeability is 5,200 or higher.

9. The steel sheet for a tension mask according  
5 to claim 7, wherein said anhysteretic magnetic permeability is 6,000 or higher.

10. A method of manufacturing a steel sheet for a tension mask excellent in both the shielding properties from geomagnetism and the creep resistance under high  
10 temperatures, comprising the steps of:

obtaining a steel piece consisting essentially of lower than 0.1% by weight of C, lower than 0.2% by weight of Si, higher than 0.6% and not higher than 2% by weight of Mn, not higher than 0.1% by weight of P, not higher than 0.03% by weight of S, not higher than 0.01% by weight of sol. Al, not lower than 0.006% and lower than 0.01% by weight of N, and the balance of Fe;

hot rolling said steel piece;

cold rolling once or a plurality of times the hot-  
20 rolled steel sheet with or without an intermediate annealing treatment interposed between the adjacent cold rolling processes so as to prepare a steel sheet having a predetermined thickness; and

annealing the resultant steel sheet under a temperature region not higher than the recrystallization temperature so as to increase the  
25 anhysteretic magnetic permeability.

11. The method of manufacturing a steel sheet for a tension mask according to claim 10, wherein said annealing step is carried out under a temperature range between the recrystallization temperature and 510°C.

5 12. The method of manufacturing a steel sheet for a tension mask according to claim 10, wherein said annealing step is carried out under a temperature range between the recrystallization temperature and 560°C.

10 13. A steel sheet for a tension mask excellent in the shielding properties from geomagnetism, said steel sheet being manufactured by the method comprising the steps of:

15 obtaining a steel piece consisting essentially of lower than 0.1% by weight of C, lower than 0.2% by weight of Si, 0.4 to 2% by weight of Mn, not higher than 0.1% by weight of P, not higher than 0.03% by weight of S, not higher than 0.01% by weight of sol. Al, 0.003 to 0.02% by weight of N, and the balance of Fe;

hot rolling said steel piece;

20 cold rolling once or a plurality of times the hot-rolled steel sheet with or without an intermediate annealing treatment interposed between the adjacent cold rolling processes so as to prepare a steel sheet having a predetermined thickness; and

25 annealing the resultant steel sheet under a temperature region not higher than the recrystallization temperature so as to increase the

anhysteretic magnetic permeability.

14. A steel sheet for a tension mask excellent in both the shielding properties from geomagnetism and the creep resistance under high temperatures, said steel  
5 sheet being manufactured by the method comprising the steps of:

obtaining a steel piece consisting essentially of lower than 0.1% by weight of C, lower than 0.2% by weight of Si, higher than 0.6% and not higher than 2%  
10 by weight of Mn, not higher than 0.1% by weight of P, not higher than 0.03% by weight of S, not higher than 0.01% by weight of sol. Al, not lower than 0.006% and lower than 0.01% by weight of N, and the balance of Fe;

hot rolling said steel piece;

15 cold rolling once or a plurality of times the hot-rolled steel sheet with or without an intermediate annealing treatment interposed between the adjacent cold rolling processes so as to prepare a steel sheet having a predetermined thickness; and

20 annealing the resultant steel sheet under a temperature region not higher than the recrystallization temperature so as to increase the anhysteretic magnetic permeability.

15. A tension mask formed of a steel sheet  
25 consisting essentially of lower than 0.1% by weight of C, lower than 0.2% by weight of Si, 0.4 to 2% by weight of Mn, not higher than 0.1% by weight of P, not higher

than 0.03% by weight of S, not higher than 0.01% by weight of sol. Al, 0.003 to 0.02% by weight of N, and the balance of Fe, and having an anhysteretic magnetic permeability of 5,000 or higher.

5        16. A tension mask formed of a steel sheet consisting essentially of lower than 0.1% by weight of C, lower than 0.2% by weight of Si, higher than 0.6% and not higher than 2% by weight of Mn, not higher than 0.1% by weight of P, not higher than 0.03% by weight of S, not higher than 0.01% by weight of sol. Al, not lower than 0.006% and lower than 0.01% by weight of N, and the balance of Fe, and having an anhysteretic magnetic permeability of 5,000 or higher.

15        17. A cathode ray tube comprising a tension mask formed of a steel sheet consisting essentially of lower than 0.1% by weight of C, lower than 0.2% by weight of Si, 0.4 to 2% by weight of Mn, not higher than 0.1% by weight of P, not higher than 0.03% by weight of S, not higher than 0.01% by weight of sol. Al, 0.003 to 0.02% by weight of N, and the balance of Fe, and having an anhysteretic magnetic permeability of 5,000 or higher.

20        18. A cathode ray tube comprising a tension mask formed of a steel sheet consisting essentially of lower than 0.1% by weight of C, lower than 0.2% by weight of Si, higher than 0.6% and not higher than 2% by weight of Mn, not higher than 0.1% by weight of P, not higher than 0.03% by weight of S, not higher than 0.01% by

weight of sol. Al, not lower than 0.006% and lower than 0.01% by weight of N, and the balance of Fe, and having an anhysteretic magnetic permeability of 5,000 or higher.

5           19. A method capable of improving a magnetic properties of a steel sheet for a tension mask, comprising the steps of preparing a cold-rolled steel sheet and annealing the cold-rolled steel sheet under a temperature region not higher than the  
10          recrystallization temperature so as to increase the anhysteretic magnetic permeability.